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Notes:

1. Untranslatable words are replaced with asterisks (* * *).
2. Texts in the figures are not translated and shown as it is.

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FULL CONTENTS

[Claim(s)]

[Claim 1] In the member's store by an IC card which can be settled, it responds to a request of the sales transaction by an IC card holder. In the electronic clearing system which transfers said dealings price to the account of the redemption aforementioned member's store for dealings price from the bank account of said IC card holder through a network The balance in an IC card which shows the balance upper limit in an IC card and the present frame which can be dealt with which is a maximum frame by this IC card which can be dealt with in said IC card is memorized. The frame of the suspension deposit equivalent to the sum of the balance in said IC card and an off-line sales outstanding frame is prepared in the bank account of said card holder. It is judged whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder. When it is more than the price that requires the balance in said IC card for said sales transaction Recognize said sales transaction in off-line processing, and the price which starts said sales transaction from the balance in said IC card is reduced. By transmitting the sales data containing the price concerning said sales transaction to the bank where the bank account of said card holder consists in batch processing, the balance in said IC card in said suspension deposit and said off-line sales outstanding frame are updated. The electronic clearing system by the IC card characterized by performing settlement-of-accounts processing including carrying out account redemption of said off-line sales outstanding frame in said suspension deposit in batch processing.

[Claim 2] In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is more than the price concerning said dealings price, account redemption of the price which starts said dealings price from this bank account balance on-line is performed. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is said more than balance upper limit in an IC card, the balance in said IC card in said IC card is recovered to said balance upper limit in an IC card on-line. The electronic clearing system by the IC card according to claim 1 characterized by updating the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[Claim 3] In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in

said IC card] When it is more than the price concerning said dealings price, account redemption of the price which starts said dealings price from this bank account balance on-line is performed. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than said balance upper limit in an IC card, on-line [the balance in said IC card in said IC card] It updates in the frame which deducted said off-line sales outstanding sum from the account balance of said card holder. The electronic clearing system by the IC card according to claim 1 characterized by updating the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[Claim 4] In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than the price concerning said dealings price, a sales transaction is refused on-line. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is said more than balance upper limit in an IC card, the balance in said IC card in said IC card is recovered to said balance upper limit in an IC card on-line. The electronic clearing system by the IC card according to claim 1 characterized by updating the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[Claim 5] In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than the price concerning said dealings price, a sales transaction is refused on-line. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than said balance upper limit in an IC card, on-line [the balance in said IC card in said IC card] It updates in the frame which deducted said off-line sales outstanding sum from the account balance of said card holder. The electronic clearing system by the IC card according to claim 1 characterized by updating the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the electronic clearing system especially by a DEBITTO method about the electronic clearing system which used the IC card.

[0002]

[Description of the Prior Art] While Electronic Commerce Technology Division based on an information-and-telecommunications network is progressing, it is certain and construction of the high electronic clearing system of safety has been an important technical problem. What is called a debit card that applied the DEBITTO method which is one of the electronic clearing systems was started to use from this year also in our country. In a DEBITTO method, when a customer purchases goods etc. in a member's store, a member's store will check a customer's bank account balance, and will transfer a purchase price to the account of redemption and a

member's store from a customer's account. Therefore, there is no risk of price arrears for a member's store. A member's store checks the bank account balance of the customer concerned through a network by applying the card concerned to the terminal installed in the store by a customer usually showing a member's store a debit card in this processing.

[0003] each time when a member's store carries out the sales transaction of the goods etc. to a customer in the conventional debit card system fundamentally -- inquiry for the balances of the bank account of the customer concerned -- on-line -- and it is performing on real time. However, [in order to actually settle accounts, it is necessary to transmit the sales data containing the data of the concrete contents of the dealings concerned, a price, etc. but, and] The single message method which performs these sales data communications simultaneously with inquiry for the balances, and performs account ***** instance, and inquiry for the balances have the dual message method which is independently overdue in time, transmits sales data, and performs *****. There is no essential difference only by these only having that difference which account ***** is real time processing, or is batch processing.

[0004] Drawing 11 is the block diagram having shown roughly the debit card system 100 by a single message method. A solid line shows real time processing and a dotted line and a dashed line show batch processing. Drawing 12 is the flow chart of the usual sales transaction processing in the system shown in drawing 11. The flow chart of drawing 12 is explained referring to drawing 11. DEBITTO ISHUA 30 publishes a debit card 11. In our country, a bank can serve as DEBITTO ISHUA. The card holder 10 of a debit card 11 can be settled with a debit card 11 in purchase, such as goods in a member's store 20. First, in Step 111 of drawing 12, a debit card 11 is presented to a member's store, the customer, i.e., the card holder, which is going to carry out a sales transaction, and it requests the settlement-of-accounts processing by a card system. Next, in Step 112, the card 11 concerned is applied to the member's store terminal 12, and it refers for the balance of the bank account 14 of a card holder on-line through a network 13. That is, it is checked whether there is more account balance of a card holder than the goods price for dealings. Here, the account 14 of a card holder is an account which consists in the bank which is the publisher of the debit card concerned. In a single message method, both sales data is also simultaneously transmitted at this time. If there is more account balance than a goods price, in Step 113, ***** will be performed from the account of a card holder. Then, in Step 114, a processing result is notified by the predetermined printout etc. through the member's store terminal 12. In Step 115, settlement of accounts is performed in batch processing after that. In Step 112, if the account balance of a card holder is less than a goods price, refusal to deal is carried out and that is notified in Step 116.

[0005] The settlement of accounts by batch processing shown in drawing 11 is illustration, and is not restricted to the composition of illustration. Usually, DEBITTO AKUAIARA 17 (those who perform a member's store contract) performs the charges forward of price to the member's store account 15, and DEBITTO Aqua Layer 17 collects price from the account 14 of a card holder. Since it may become [two or more] and settlement-of-accounts processing becomes complicated in that case, as for DEBITTO Aqua Layer 17, it is common that one brand 16 performs settlement-of-accounts processing collectively. DEBITTO ISHUA 30, DEBITTO Aqua Layer 17, and the brand 16 need to be functional distinction, and do not necessarily need to be a separate organization, and one organization can serve as two or more functions.

[0006] Drawing 13 is the block diagram having shown roughly the debit card system 200 by a dual message method (about the common or similar constituent factor in each Drawings, the same mark is used hereafter). Drawing 14 is the flow chart of the usual sales transaction processing in the system shown in drawing 13. The flow chart of drawing 14 is explained referring to drawing 13. First, in Step 211 of drawing 14, a debit card 11 is presented to a member's store 20, the customer 10, i.e., the card holder, which is going to carry out a sales transaction, and it requests the settlement-of-accounts processing by a card system. Next, in Step 112, the card 11 concerned is applied to the member's store terminal 12, and it refers for the balance of the bank account 14

of a card holder on-line through a network 13. That is, it is checked whether there is more account balance of a card holder than the goods price for dealings. Here, the account 14 of a card holder is an account in the bank which is the publisher (inside of drawing 13 , DEBITTO ISHUA 20) of the debit card concerned. In a dual message method, sales data is not simultaneously transmitted at this time. If there is more account balance than a goods price, in Step 213, the suspension deposit which corresponds in the account of a card holder at a goods price will be secured. A deposit restraint is carried out and the portion of this suspension deposit becomes impossible [a drawer]. This is for avoiding the risk of the price arrears by real time processing of the account redemption not being carried out. Then, in Step 214, a processing result is notified by the predetermined printout etc. through the member's store terminal 12. Furthermore, in Step 215, after sales data is transmitted through a network 13 by batch processing at the predetermined time, it performs, a cut, i.e., account ***** , of suspension deposit, and settlement-of-accounts processing is performed like the above-mentioned single message method in Step 215 after that. In Step 212, if the account balance of a card holder is less than a goods price, refusal to deal is carried out and that is notified in Step 217.

[0007]

[Problem to be solved by the invention] As stated above [the conventional debit card system] In order to hold the online inquiry of a customer's account balance on real time and to perform deposit suspension ***** or instantency at every sales transaction, there is no risk of price arrears, but on the other hand, the burden of the communication cost and communications processing time poses a big problem. Especially the thing that the rate of the processing cost occupied to sale proceeds becomes higher as a sales unit price becomes a small amount serves as a serious obstacle in the system concerned by which the development in the retail field is expected.

[0008] Moreover, in order to, secure the security required of the card for electronic banking on the other hand, the shift to an IC card from the conventional magnetic card is progressing. compared with a magnetic card, an alteration, forgery, etc. are difficult for an IC card -- in addition, it has the advantage that a lot of information can be held. Therefore, by holding and managing conventionally the information, including the arrears balance, the drawer possible balance, the account balance, etc., managed, the card publisher's customer master, i.e., computer, in an IC card, on-line processing, such as the conventional account reference, may be able to be performed as it is unnecessary.

[0009] In the debit card system whose this invention is one of the electronic clearing systems in view of the above situation It aims at offering the system which can reduce the communication cost by real-time reference sharply, and pays, and can avoid the damage risk by arrears for a proxy etc. by using the high IC card of security nature.

[0010]

[Means for solving problem] This invention offers the following composition in order to solve the above-mentioned purpose.

[0011] (1) [the electronic clearing system using the IC card by this invention] In the member's store by an IC card which can be settled, it responds to a request of the sales transaction by an IC card holder. In the electronic clearing system which transfers said dealings price to the account of the redemption aforementioned member's store for dealings price from the bank account of said IC card holder through a network The balance in an IC card which shows the balance upper limit in an IC card and the present frame which can be dealt with which is a maximum frame by this IC card which can be dealt with in said IC card is memorized. The frame of the suspension deposit equivalent to the sum of the balance in said IC card and an off-line sales outstanding frame is prepared in the bank account of said card holder. It is judged whether it is more than the price that requires the balance in said IC card for this sales transaction by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder. When it is more than the price that requires the balance in said IC card for said sales transaction By recognizing said sales transaction in off-line processing,

reducing the price which starts said sales transaction from the balance in said IC card, and transmitting the sales data containing the price concerning said sales transaction to the bank where the bank account of said card holder consists in batch processing The balance in said IC card in said suspension deposit and said off-line sales outstanding frame are updated, and it has the composition which performs settlement-of-accounts processing including carrying out account redemption of said off-line sales outstanding frame in said suspension deposit in batch processing.

[0012] (2) In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction in the composition of the above (1) by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is more than the price concerning said dealings price, account redemption of the price which starts said dealings price from this bank account balance on-line is performed. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is said more than balance upper limit in an IC card, the balance in said IC card in said IC card is recovered to said balance upper limit in an IC card on-line. It has the composition which updates the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[0013] (3) In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction in the composition of the above (1) by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is more than the price concerning said dealings price, account redemption of the price which starts said dealings price from this bank account balance on-line is performed. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than said balance upper limit in an IC card, on-line [the balance in said IC card in said IC card] It has the composition which updates in the frame which deducted said off-line sales outstanding sum from the account balance of said card holder, and updates the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[0014] (4) In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction in the composition of the above (1) by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than the price concerning said dealings price, a sales transaction is refused on-line. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When it is said more than balance upper limit in an IC card, the balance in said IC card in said IC card is recovered to said balance upper limit in an IC card on-line. It has the composition which updates the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[0015] (5) In the step which judges whether it is more than the price that requires the balance in said IC card for this sales transaction in the composition of the above (1) by applying said IC card to said member's store terminal according to a request of the sales transaction by said card holder When the balance in said IC card is less than the price concerning said sales transaction It refers for the bank account of said card holder real time

and on-line. [the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than the price concerning said dealings price, a sales transaction is refused on-line. [then, the frame which deducted said suspension deposit from the bank account balance of said card holder, and added the balance in said IC card] When less than said balance upper limit in an IC card, on-line [the balance in said IC card in said IC card] It has the composition which updates in the frame which deducted said off-line sales outstanding sum from the account balance of said card holder, and updates the frame of said suspension deposit in the frame equivalent to the sum of the recovered balance in said IC card, and said off-line sales outstanding frame.

[0016]

[Mode for carrying out the invention] With reference to drawing 1 or drawing 10, the embodiment of the debit card system by this invention is explained hereafter. Drawing 1 defines main constituent factors first. Drawing 1 (A) shows typically the bank account 14 which the debit card holder has established. The whole pillar shows the balance 21 of the bank account of a card holder. The account balance 21 consists of a portion of the suspension deposit 22, and the other portion 23. The suspension deposit 22 is the portion by which the deposit restraint was carried out, and is a portion in which a deposit drawer is impossible. Incidentally the frame of the suspension deposit 22 is set as the balance upper limit 41 in an IC card and the same amount which are shown in drawing 1 (B) at the time of a debit card application.

[0017] If a sales transaction is performed, the frame of the suspension deposit 22 will be changed, but the items serve as "a balance + off-line sales outstanding frame in an IC card." About this, it is supposed that it is clear from the below-mentioned explanation.

[0018] When the portion of the suspension deposit 22 exists in the bank account balance 21, the account balance with a depositor freely available with means other than an IC card serves as a portion shown by the "card holder account balance-suspension deposit" 23, i.e., a mark.

[0019] Drawing 1 (B) shows typically composition, the debit card 11, i.e., the IC card, used by this system. The IC chip 40 is incorporated in IC card 11, and the reading writing of predetermined data is possible through a member's store terminal. In this system, the balance upper limit 41 in an IC card of a card holder and the balance 42 in the card in IC are memorized at least in the IC chip 40. In the balance upper limit 41 in an IC card, it is the upper limit of the balance secured in an IC card, and is the fixed value set up at the time of a card application. The balance in an IC card is the balance secured to the present IC card, and if a card holder performs a sales transaction, it will be changed.

[0020] Drawing 2 is the outline block diagram showing the most fundamental processing by this system, and drawing 3 is the flow chart. A solid line shows real time processing among drawing 2, and a dotted line and a dashed line show batch processing (in the following same Drawings, it is the same). In Step 311 of drawing 3, the card holder 10 tends to purchase goods etc. in a member's store 20, and requests the settlement-of-accounts processing by a debit card 11. The member's store 20 which received the request applies IC card 11 to the member's store terminal 12. And in Step 312, it is judged whether the balance in an IC card in IC card 11 is more than a goods price. If the balance in an IC card is more than a goods price, sales transactions, such as goods in question, will be recognized without the member's store terminal 12 referring for the bank account 14 of a card holder in Step 313. And processing in which only the frame equivalent to a goods price reduces the balance in an IC card is performed. In Step 314, while returning IC card 11 to the card holder 10, processing results (printout including the details of the contents of dealings) are passed. Thus, it is recognizing the sales transaction concerned, without performing account inquiry for the balances of on-line on the real time through a network 13, when it is judged that one of the features of this system has the enough balance in IC card 11. In this system, this processing is called "off-line recognition."

[0021] A subsequent step is performed by batch processing. For example, some dealings are summarized and

new sales data is transmitted to a bank 30 through a network 13 every day or in several days. Based on this new sales data, the contents of the suspension deposit 22 in the card holder account 14 are updated. That is, the frame equivalent to the goods price contained in new sales data is added to the off-line sales outstanding frame in the suspension deposit 22 in [drawing 1](#) (A).

[0022] Next, by performing account redemption of Step 315, the off-line sales outstanding frame in the suspension deposit 22 is made into ****. By this, an off-line sales outstanding frame will disappear from the inside of the suspension deposit 22, and the suspension deposit 22 will be in agreement with the balance in an IC card after the sales transaction included in new sales data.

[0023] Furthermore, in Step 316, settlement of accounts between payment [account / member's store] and a payment proxy is too performed in batch processing, and settlement of accounts is completed.

[0024] [Drawing 4](#) and Table 1 show the easy example of the processing shown in [drawing 2](#) and [drawing 3](#).

The balance upper limit in an IC card of this card is set as 10,000 yen, and the balance in an IC card at the time of a processing request (Step 311 of [drawing 3](#)) remains to upper limit. On the other hand, the account balance of the card holder at this time is 30,000 yen, and the frame of 10,000 yen of the suspension deposit of the balance upper limit in an IC card and the same amount is set up.

[0025] A card holder presupposes that it was going to purchase the goods which are 8000 yen. Since the balance in an IC card is more than a goods price, off-line recognition is carried out (Step 313 of [drawing 3](#)).

Although the balance in an IC card is reduced by a goods price and changes to 2000 yen at this time, on the other hand, change will be in the state of a bank account. Then, if sales data is sent to a bank by batch processing, the off-line settlement-of-accounts unsettled frame of 8000 yen will be set up in suspension deposit, and this frame will be made into **** if account redemption is performed (Step 315 of [drawing 3](#)). Therefore, the amount of suspension deposit of an account changes to 2000 yen after account redemption. Though natural, the whole account balance of a card holder also serves as a cut 8000 yen, and changes to 22,000 yen.

[0026]

[Table 1]

	処理依頼時	オフライン承認後	口座引落後
ICカード内残高上限値	10,000円	10,000円	10,000円
ICカード内残高	10,000円	2,000円	2,000円
カード保有者口座残高	30,000円	30,000円	22,000円
・保留預金	10,000円	10,000円	2,000円
・(口座残高)－(保留預金)	20,000円	20,000円	20,000円

[0027] As long as the balance in an IC card is more than a goods price as above-mentioned, the sales transaction by off-line recognition becomes possible. Thereby, the cost of the real-time on-line recognition to which the sales transaction was performed conventionally as for the degree of capital is sharply reducible.

[0028] However, since it is reduced whenever it carries out merchandise purchase of the balance in an IC card,

the situation where the balance in an IC card is less than a goods price produces it someday. That is, it is the case where it is judged as no (N) in Step 312 of [drawing 3](#) . Processing of this situation is also considered in this system.

[0029] [Drawing 5](#) is the outline block diagram of processing when it is judged that the balance in an IC card in an IC card is less than a goods price in Step 312 of [drawing 3](#) , and [drawing 6](#) is the flow chart. First, in Step 411 of [drawing 6](#) , the member's store terminal 12 performs a real-time online inquiry to the bank account 14 of a card holder through a network 13, and judges whether "the balance in + (card holder account balance-suspension deposit) IC card" is more than a goods price. If it puts in another way, it will be judged whether the frame (namely, available account balance of a card holder) of the portion except an off-line sales outstanding frame is a frame in which merchandise purchase is possible among the card holder account balances. In Step 411, if the available account balance of a card holder is more than a goods price, in Step 412, account redemption will be performed on real time.

[0030] Next, in Steps 413 to 415, balance recovery in an IC card is performed by real-time on-line processing. First, in Step 413, "the balance in + (card holder account balance-suspension deposit) IC card" judges whether it is more than the set-up balance upper limit in an IC card. if the available account balance of a card holder is more than the balance upper limit in an IC card, it can newly recover the balance in a until [upper limit full] IC card. Therefore, in Step 414, the balance in an IC card is recovered to upper limit. On the other hand, when the available account balance of a card holder is less than the balance upper limit in an IC card, in Step 415, the balance in an IC card is updated in a "card holder account balance-off-line sales outstanding frame." In the case of Step 415, although it is less than upper limit, the balance in a card will be recovered to the maximum value with an available card holder.

[0031] In Step 414 or 415, after performing recovery of the balance in an IC card, in Step 416, recovery of the suspension deposit in the account balance of a card holder is performed. Suspension deposit is updated so that it may become "a balance + off-line sales outstanding frame in an IC card."

[0032] Next, a processing result is passed to a card holder in Step 417. In Step 418, the settlement of accounts by batch processing is completed after that.

[0033] Thus, in this system, a card holder does not need to perform balance recovery in an IC card intentionally. If the account balance of a card holder comes out enough and the balance in an IC card is decreasing below to upper limit not to mention a certain thing with a possible sales transaction which restricts, it will recover to upper limit automatically. Therefore, the card holder of this system does not need to pay attention to the balance in a card. For example, although there is a system which transfers and uses electronic money for an IC card from a bank account conventionally, it needs to be cautious of whether a card holder always has the enough balance in a card, and the card holder itself must re-fill up electronic money with such a system in a card. as compared with this electronic money system, this system is boiled markedly and is excellent in the convenience for a user.

[0034] [Drawing 7](#) and Table 2 show the easy example of the processing shown in [drawing 5](#) and [drawing 6](#) . Although the balance upper limit in an IC card of the card is set as 10,000 yen, the balance in an IC card at the time of a processing request (Step 311 of [drawing 3](#)) is decreasing to 1000 yen. On the other hand, the account balance of the card holder at this time is 22,000 yen, among those the frame of suspension deposit is 2000 yen. 1000 yen in suspension deposit are a part for an off-line sales outstanding frame.

[0035] At this time, a card holder presupposes that it was going to purchase the goods which are 16,000 yen. Since the balance in an IC card of 1000 yen is less than a goods price (Step 312 of [drawing 3](#)), processing by real-time on-line is started. Since it is judged by the online inquiry that "the balance in + (card holder account balance-suspension deposit) IC card" is 21,000 yen, and they are the goods prices of 16,000 yen or more, on-line account redemption is performed. The card holder account balance changes to 6000 yen after redemption,

among these suspension deposit changes to 2000 yen (1000 yen is an off-line sales outstanding frame).
 [0036] Next, balance recovery in an IC card is performed. In this case, even if it totals the available account balance of 4000 yen of a card holder, and balances in an IC card of 1000 yen, it is less than 10,000 yen of the balance upper limit in an IC card. Therefore, it is considered as the balance in an IC card new in 5000 yen which deducted the off-line sales outstanding sum of 1000 yen from the card holder account balance of 6000 yen.

[0037] Furthermore, in the suspension deposit recovery of a card holder account, it is considered as the suspension deposit with 6000 new yen which added the off-line sales outstanding frame of 1000 yen to the balance in an IC card of 5000 yen. That is, since the whole account balance of a card holder serves as suspension deposit, the portion in which a drawer is possible is lost freely.

[0038]

[Table 2]

	処理依頼時	オンライン ICカード内残高回復	
		口座引落後	保留預金回復後
ICカード内残高上限値	10,000円	10,000円	10,000円
ICカード内残高	1,000円	1,000円	5,000円
カード保有者口座残高	22,000円	6,000円	6,000円
・保留預金	2,000円	2,000円	6,000円
・〈口座残高〉-〈保留預金〉	20,000円	4,000円	0円

[0039] Finally in Step 411 of [drawing 6](#), processing when "the balance in + (card holder account balance-suspension deposit) IC card" is less than a goods price is explained. [Drawing 8](#) shows the outline block diagram of processing in this case, and [drawing 9](#) shows a flow chart. In this case, since the available account balance of a card holder is less than a goods price, a sales transaction cannot be recognized. Therefore, it opts for refusal to deal in Step 511.

[0040] However, in Steps 512 to 514, balance recovery in an IC card is succeedingly performed like Steps 413 to 415 of [drawing 6](#). First, in Step 512, "the balance in + (card holder account balance-suspension deposit) IC card" judges whether it is more than the set-up balance upper limit in an IC card. if the available account balance of a card holder is more than the balance upper limit in an IC card, it can newly recover the balance in a until [upper limit full] IC card. Therefore, in Step 513, the balance in an IC card is recovered to upper limit. On the other hand, when the available account balance of a card holder is less than the balance upper limit in an IC card, in Step 514, the balance in an IC card is updated in a "card holder account balance-off-line sales outstanding frame." In the case of Step 514, although it is less than upper limit, the balance in a card is recovered to the maximum value with an available card holder.

[0041] Furthermore, in Step 515, recovery of the suspension deposit in the account balance of a card holder is

performed. Suspension deposit is updated so that it may become "a balance + off-line sales outstanding frame in an IC card." Finally in Step 516, the processing result of recovery of the purport that the sales transaction was refused, and the balance in an IC card is passed to a card holder.

[0042] As shown in [drawing 8](#) and [drawing 9](#), even if the sales transaction itself is the case where it is refused, recovery of the balance in an IC card and recovery of suspension deposit are automatically performed by holding an online inquiry.

[0043] [Drawing 10](#) and Table 3 show the easy example of the processing shown in [drawing 8](#) and [drawing 9](#). Although the balance upper limit in an IC card of the card is set as 10,000 yen, the balance in an IC card at the time of a processing request (Step 311 of [drawing 3](#)) is decreasing to 2000 yen. On the other hand, the account balance of the card holder at this time is 22,000 yen, among those the frame of suspension deposit is 2000 yen. The amount of off-line sales outstanding frame is not in the inside of suspension deposit in this example.

[0044] At this time, a card holder presupposes that it was going to purchase the goods which are 24,000 yen. First, since the balance in an IC card of 2000 yen is less than a goods price (Step 312 of [drawing 3](#)), processing by real-time on-line is started. Since "the balance in + (card holder account balance-suspension deposit) IC card" is 22,000 yen and is less than the goods prices of 24,000 yen as a result of an online inquiry (Step 411 of [drawing 6](#)), refusal of a sales transaction is determined. Therefore, at this time, change is not produced in an IC card and a card holder account. Then, balance recovery in an IC card is performed. In this case, if the available account balance of 20,000 yen of a card holder and balances in an IC card of 2000 yen are totaled, it will change to 10,000 yen or more of the balance upper limit in an IC card. Therefore, the balance in an IC card is recovered to 10,000 yen of the balance upper limit in an IC card.

[0045] Furthermore, in the suspension deposit recovery of a card holder account, the balance in an IC card of 10,000 yen is considered as a new suspension deposit. In this case, it is because the amount of off-line sales outstanding frame is not. In this system, even if it is the case of online trade refusal, recovery of the balance in an IC card and suspension deposit will be performed automatically, and the maximum convenience will be secured for a card holder.

[0046]

[Table 3]

処理依頼時 オンライン ICカード内残高回復

取引拒否後 保留預金回復後

ICカード内残高上限値	10,000円	10,000円	10,000円
ICカード内残高	2,000円	2,000円	10,000円
カード保有者口座残高	22,000円	22,000円	22,000円
・保留預金	2,000円	2,000円	10,000円
・(口座残高)-(保留預金) 20,000円	22,000円	12,000円	

[0047]

[Effect of the Invention] In the debit card system using the IC card of security nature with high this invention as stated above The execution frequency of a real-time online inquiry can be reduced by performing dealings recognition off-line, without holding an online inquiry, if the balance in a card memorized in the IC card is more than a goods price. Thereby, the cost which the real-time online inquiry had taken for every dealings in the system conventionally is reduced sharply. Therefore, this debit card system can turn into a very effective system as a practical electronic clearing system in a wide range of financial fields containing the retail field.

[0048] In addition, it is also the advantage of this system by paying and preparing a suspension deposit frame in the account of a card holder for a proxy etc. that the risk of the arrears by not performing an online inquiry and real-time account redemption at every sales transaction can avoid certainly.

[0049] Furthermore, this system is excellent in convenience also for the card holder. Although it pays by off-line recognition and has a common feature with the conventional electronic money system in that it is possible, for a user, the time and effort which performs re-restoration of monetary value is unnecessary, and epoch-making in the point that the balance in an IC card is recovered automatically. Moreover, simultaneously with it, it is epoch-making also at the point of being updated automatically, the card available frame, i.e., the suspension deposit, in a bank account.

[0050] Moreover, even if the balance upper limit in an IC card is the case where it is stopped low because of arrears risk aversion, by changing from off-line processing to on-line processing automatically, the bank account balance of a card holder can be checked and it can respond also to big-ticket shopping. Thus, this invention provides the electronic banking service with very high pliability.

[Brief Description of the Drawings]

[[Drawing 1](#)] (A) is the figure showing typically the bank account which the debit card holder has established, and (B) is the figure showing typically the information memorized in an IC card.

[[Drawing 2](#)] It is the outline block diagram by this invention showing fundamental processing most.

[[Drawing 3](#)] It is the flow chart of processing of [drawing 2](#).

[[Drawing 4](#)] It is the figure showing typically the easy example of the processing shown in [drawing 2](#) and [drawing 3](#).

[[Drawing 5](#)] In Step 312 of [drawing 3](#), it is the outline block diagram of processing at the time of being judged as no (N).

[[Drawing 6](#)] It is the flow chart of processing of [drawing 5](#).

[[Drawing 7](#)] It is the figure showing typically the easy example of the processing shown in [drawing 5](#) and [drawing 6](#).

[[Drawing 8](#)] In Step 411 of [drawing 6](#), it is the outline block diagram of processing at the time of being judged as no (N).

[[Drawing 9](#)] It is the flow chart of processing of [drawing 8](#).

[[Drawing 10](#)] It is the figure showing typically the easy example of the processing shown in [drawing 8](#) and [drawing 9](#).

[[Drawing 11](#)] It is the block diagram having shown roughly the debit card system by the conventional single message method.

[[Drawing 12](#)] It is the flow chart of the usual sales transaction processing in the system shown in [drawing 11](#).

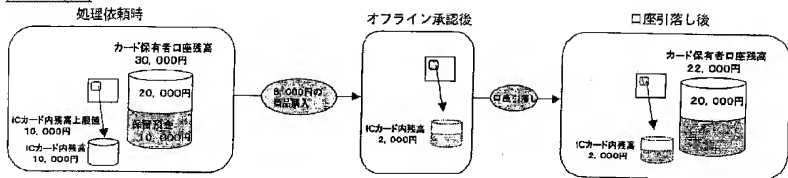
[[Drawing 13](#)] It is the block diagram having shown roughly the debit card system by the conventional double message method.

[Drawing 14] It is the flow chart of the usual sales transaction processing in the system shown in drawing 13.

[Explanations of letters or numerals]

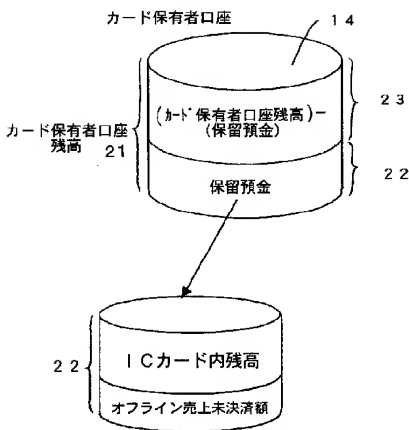
- 10 Card Holder
- 11 Debit Card (IC Card)
- 12 Member's Store Terminal
- 13 Network
- 14 Account of Card Holder
- 15 Sales Data
- 16 Brand
- 17 DEBITTO AKUAIARA
- 18 Account of Member's Store
- 20 Member's Store
- 21 Card Holder Account Balance
- 22 Suspension Deposit
- 30 DEBITTO ISHUA (Bank)
- 40 IC Chip
- 41 Balance Upper Limit in IC Card
- 42 Balance in IC Card

[Drawing 4]

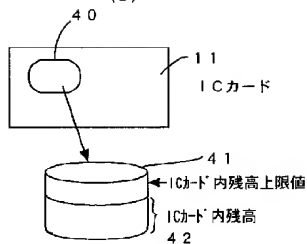


[Drawing 11]

(A)

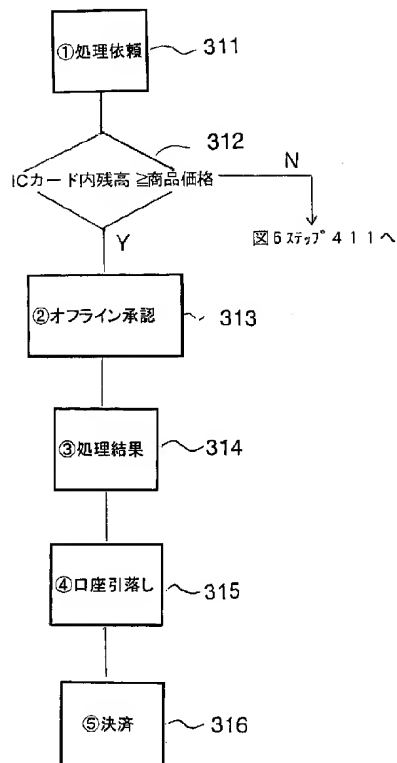


(B)

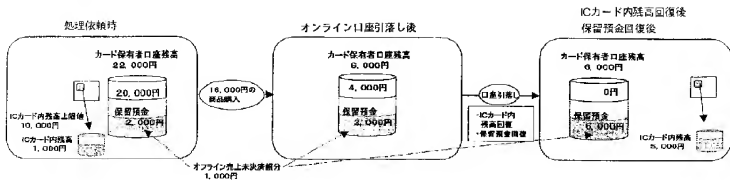


[Drawing 2]

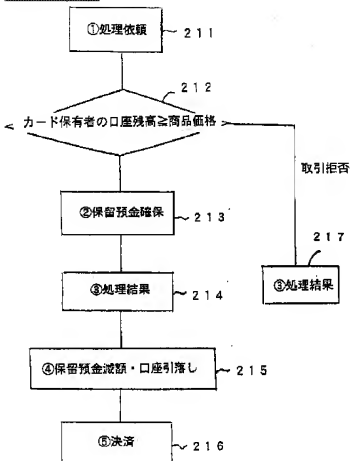




[Drawing 7]

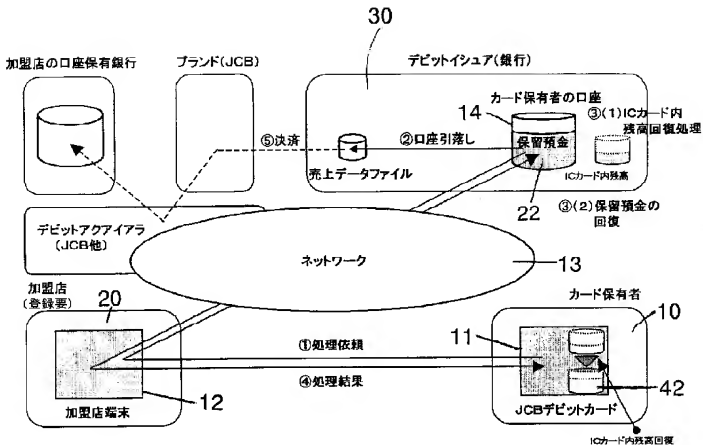


[Drawing 14]



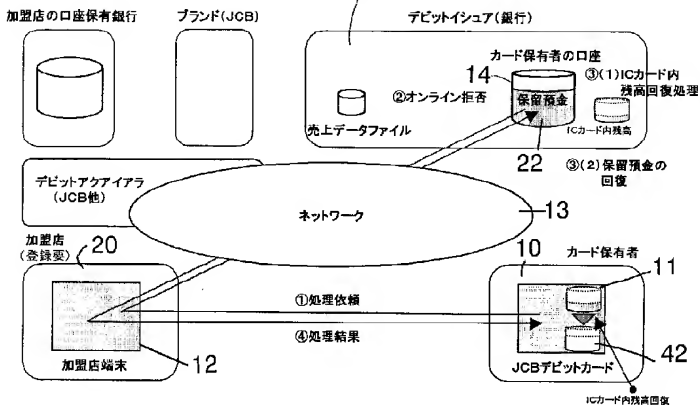
[Drawing 5]

400

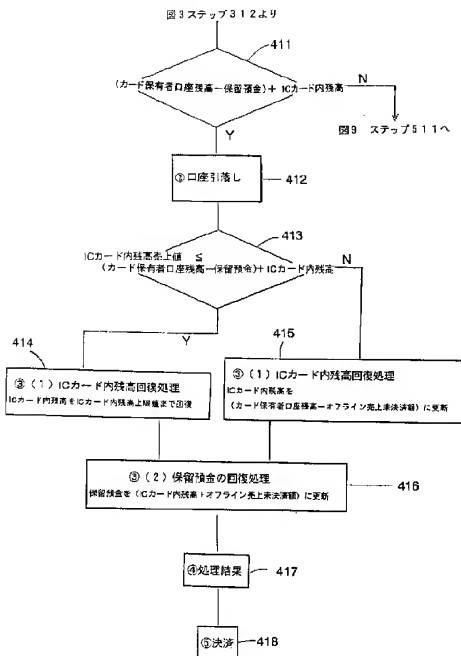


[Drawing 8]

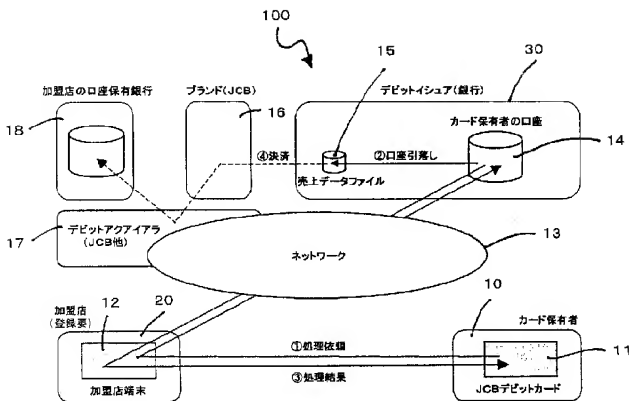
500
↓
30



[Drawing 6]

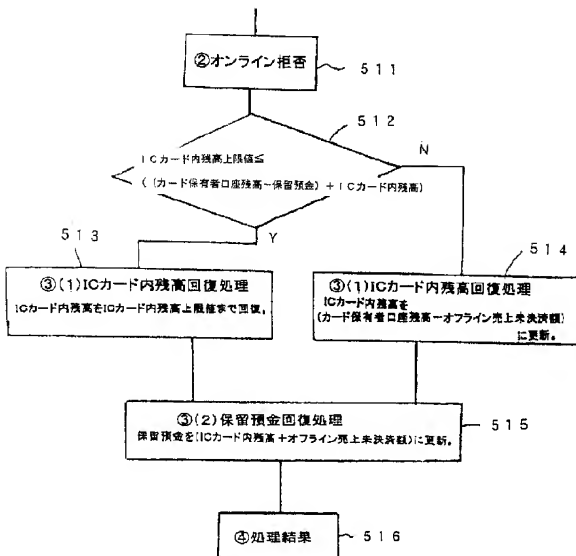


[Drawing 11]

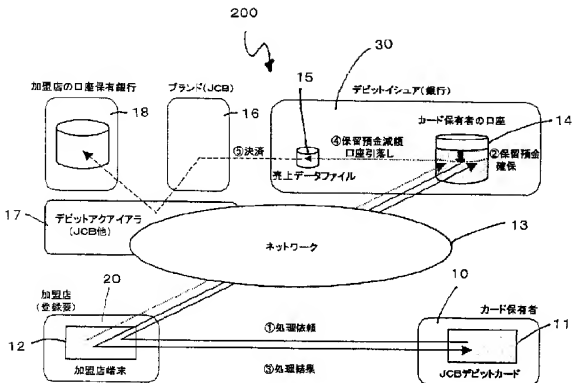


[Drawing 9]

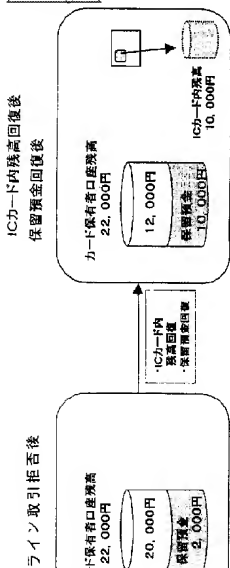
図6 ステップ411より



[Drawing 13]

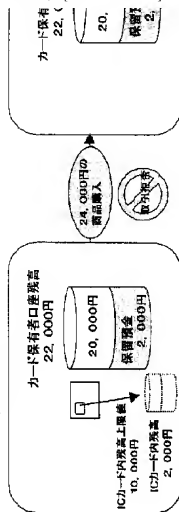


[Drawing 10]

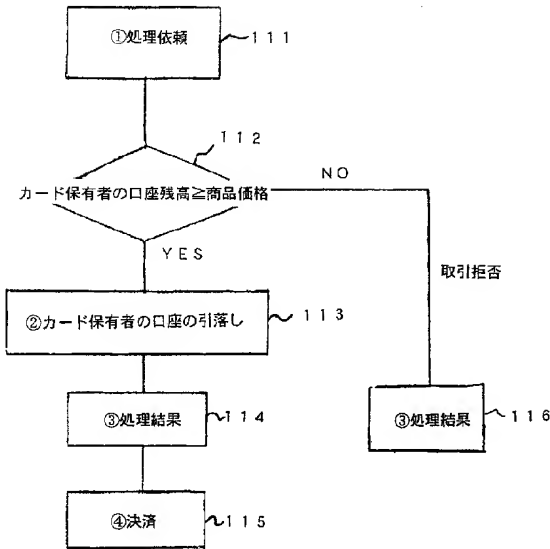


オンライン

処理依頼時



[Drawing 12]



[Translation done.]